

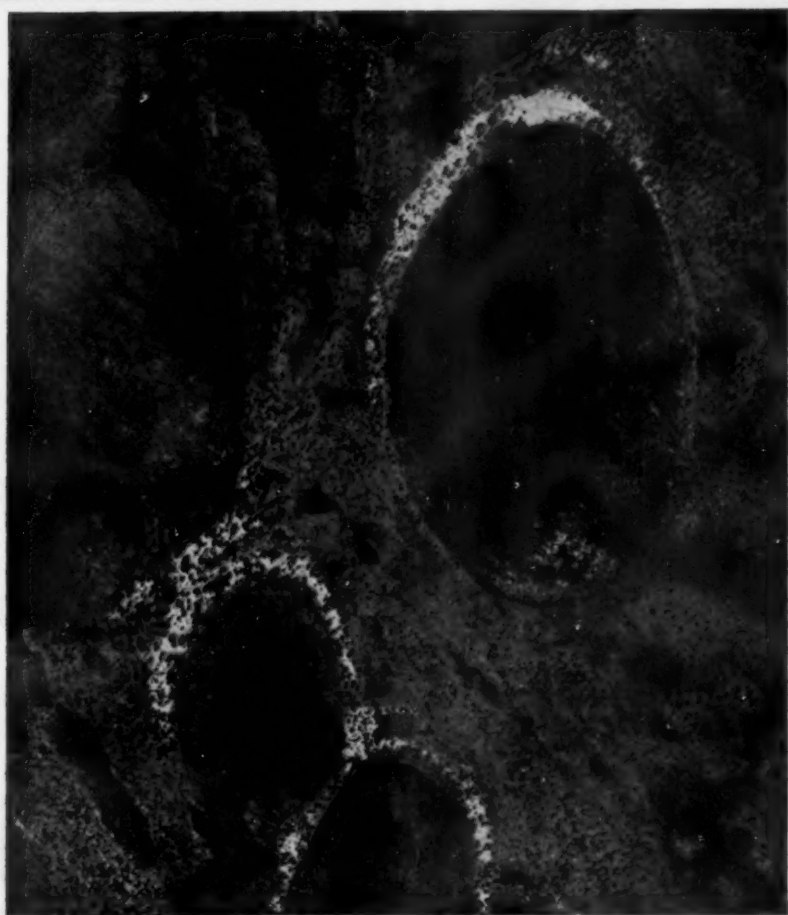
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JAN 28 1933

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



JANUARY 28, 1933

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Edited by WATSON DAVIS

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## DO YOU KNOW THAT

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Thunder seldom is heard more than fifteen miles.

More native species of grapes have been found in the United States than in all other countries.

It is estimated that dentists in this country treat 24 million patients a year, the average bill for the year being \$18.

A children's hotel where parents may leave children for a night or more in some emergency, has been established in Berlin.

Approximately 8,000 people were engaged in placer gold mining in California last year, panning out gold amounting to \$450,000, compared with \$163,000 in 1931.

Heavy snows are a danger signal to orchard growers: rabbits and other rodents eat tree bark as an emergency ration when snow and ice cut off their usual food supplies.

One Wisconsin county has obtained the "startling and appalling" information that among 400 rural school children almost one-fourth drank no milk, and another fourth drank only one cup a day.

The nun parrot of South America has a cowl over its head.

A campaign against adenoids is being waged by child-welfare aides in Italy.

Two new varieties of strawberries and a purple raspberry are announced by government plant breeders.

The North Pole is at sea level, whereas the South Pole has a mountainlike elevation of some 10,000 feet.

In the past five years, one farm in nine in the United States has changed hands because of financial difficulties.

A Roman expedition, in the days of the Emperor Nero, set out for Africa to explore the River Nile to its source.

The Chinese government is resolved to put a stop to the disastrous floods on Chinese rivers, and engineering experiments to that end are now going forward in a German research institute.

Florida will exhibit at the Century of Progress Exposition in Chicago an array of exotic fruits of the tropics, such as the Governor's plum and the Monstera deliciosa, with a view to acquainting the public with these fruits which the Florida climate can produce.

## WITH THE SCIENCES THIS WEEK

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Why are most new flowers named for married women? p. 58.

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## GENERAL SCIENCE

What are the entrance requirements to the super-university? p. 54. *The Quality of the Educational Process in the United States and in Europe*—William S. Learned—Carnegie Found. for the Advancement of Teaching, 1927.

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Why will the blind be aided if they are taught mimicry? p. 57.

## ZOOLOGY

Are antelopes at Nemiskam, Alberta, conscious of their captivity? p. 52.

Why is the groundhog blamed for the weather? p. 63.

These curiosity-arousing questions will be especially valuable to the teacher. Book references in italic type are not sources of information of the article, but are references for further reading. Books cited can be supplied by Librarian, Science Service, at publishers' prices, prepaid in U. S.

ENGINEERING-ECONOMICS

# Prophets of Technocracy Tell How Industry Might be Ruled

Realizing Radical Move Impossible Now, Veblen Outlined Method of Putting Engineers in Control of Industry

This is the first article of a series presented to illuminate the backgrounds and objectives of the movement that has found expression in the discussion of Technocracy. The material is given as information and news, not as our opinion or with our endorsement. The next article will describe the three kinds of experts who would rule the technologic state.

**I**F THE ENGINEER, technologist and scientist, those makers of the "machine age," are to come into control of our civilization and run our economic life, how would they govern?

This question assumes general importance due to the publicity given to Technocracy<sup>1</sup>, the current expression of the idea that technically and scientifically trained persons should control our economics and political destiny. Technocracy has seized the mantle of science, engineering and technology and has announced that the "price system is smashed." It emphasizes the obvious importance of mechanical energy today. It has not made a constructive plan for economic rehabilitation, just yet.

But the idea that science that makes the machines can best tell how to run them is not new. It has not sprung full blown out of the depression of the 1930's.

Rule by technology has its prophets. Just as Thomas Paine in his remarkable and powerful pamphlet of 1776, "Common Sense," stirred the intellectual fires that led to the American Revolution, just as Karl Marx's "Communist Manifesto" of 1847 gave the practical strategy of socialism and became the theoretical driving force behind the Communism of modern Russia, rule by technology has its prophets and manifestos.

Most articulate and challenging of these prophets, perhaps, was Thorstein Veblen. A dark-bearded ironist who received his Ph.D. at Yale, and taught economics at Chicago, Stanford and else-

where for his bread and butter, Veblen has been called the *enfant terrible* of American economics. His professional colleagues looked askance at him often and before his death a few years ago he achieved only a modicum of fame among intellectuals.

Of the penetrating and radical analyses of civilization contained in his nine published books, a single chapter in one of them vividly blue-prints the way in which technology would take over the government.

Another prophet is Prof. Frederick Soddy, the British scientist. His brilliant work on radioactivity and his 1912 theory that a chemical element can exist in different forms or isotopes of different atomic weight, since confirmed widely, won the Nobel prize in chemistry in 1921. He is now Dr. Lee's professor of chemistry at Oxford. With keen scientific eyes he has looked at civilization's economic paradox and his 1926 book, "Wealth, Virtual Wealth and Debt," challenges conventional economics. The charge has been made that the Technocracy group used his ideas freely.

With Veblen, Soddy and other "rule by technology" prophets perhaps the ma-

jority of scientists and engineers will not agree.

But their blue-prints by which technologic government would be built are worth viewing in these unsettled times.

How would technologic rule of government and industry be accomplished? Over a decade before the word "technocracy" obtained current usage, Thorstein Veblen, iconoclastic American economist, visualized the day when serious, widespread consideration would be given to a government by technologists, engineers and scientists.

He wrote a vivid blue-print of technologic government. In 1919 it was published in *The Dial* and later (1921) it became the conclud- (Turn to Page 62)

METEOROLOGY

## Origin of Newly-Found Stratosphere Clouds Sought

**T**HE EXISTENCE of clouds at heights from 15 to 19 miles above the earth, a region of the atmosphere where clouds have never before been believed to exist, has been established by observations made in Norway by Prof. C. Störmer with the photographic equipment he has successfully used in measuring the height of aurora.

These high clouds have been called "mother of pearl clouds" on account of the pureness of the spectral colors with which they glow and the concentric arrangement of their coloration in band after band similar to the color scheme inside a clamshell. Shades of pink, lilac, purple and blue occur but generally reddish hues predominate. These colors shine about as (Turn Page)



"MOTHER OF PEARL" STRATOSPHERE CLOUDS

Twice as high as the lofty clouds heretofore studied, these unusual clouds set an altitude record. They are some 15 to 19 miles above the earth. Prof. C. Störmer, their discoverer, took this photograph at Oslo, Norway, Jan. 13, 1929.

<sup>1</sup>Attention is called to the difference between "technology," the application of science to the arts, and "Technocracy," the coined word.



bright as in an average rainbow and may be seen only near sunset, increasing rapidly in brightness immediately after the sun sets.

Mother of pearl clouds have been reported most frequently after the passage of a center of low pressure, but have not been observed generally, on account of the thick low cloud obscuring their view. On the lee-side of mountains, however, the föhn winds dissolve these rain and storm clouds, permitting a view of the extremely high cloud. Mother of pearl clouds have been found to remain stationary for hours and on other occasions to move with velocities up to 100 miles per hour. On January 13, 1929, they were observed to fall a distance of one mile in an hour and a quarter.

The origin and constitution of these clouds has not so far been explained. The highest cirrus clouds formed from floating ice crystals are only eight miles high in these latitudes and until these mother of pearl clouds were discovered, the stratosphere was considered cloud-free except for the noctilucent clouds about fifty miles high and supposed to be associated with volcanic ejecta.

Observers in states and provinces just east of the Rockies would appear to be favorably situated to observe these extraordinary brilliant clouds especially during chinooks. The observer should note the time, arrangement and brilliance of colors as well as the direction and velocity of the cloud.

*Science News Letter, January 28, 1933*

#### CHEMISTRY

### Find Second Vitamin Is Produced by Ultraviolet

**T**HE ANTI-NEURITIC vitamin B has been produced by the action of ultraviolet rays on adenine sulphate, B. C. Guha and P. N. Chakravorty of the Bengal Chemical and Pharmaceutical Works, Calcutta, reported to *Nature*.

Thus it appears that two vitamins are produced by activation of a chemical with ultraviolet light. Scientists found several years ago that rickets-preventing vitamin D is formed by the action of ultraviolet light on ergosterol.

Vitamin B is found naturally in the bran layers of cereals, in vegetables, milk, eggs, liver and pancreas. Prof. Adolf Windaus of the University of Göttingen isolated the vitamin in pure form a year ago and gave it the chemical formula  $C_{12}H_{17}N_3OS$ . The Indian report indicates that the vitamin is the type of compound known as a purin.

*Science News Letter, January 28, 1933*

#### CHEMISTRY

## Improving Processes Keep Alcohol Industry Upset

**W**HETHER or not we have beer, complete repeal or prohibition as is, ethyl alcohol will continue to be one of the most important chemicals of commerce.

The chemical industry could not do its part in our modern civilization if it were deprived of its copious drafts of the liquid that is at present forbidden as a beverage to Americans.

Ethyl alcohol is an essential solvent in many industries, and many articles in the stores without the least suggestion of alcohol about them could not exist without the utilization of this solvent which ranks next to water in usefulness. In perfumes and in radiator anti-freeze, in medicines and flavoring extracts alcohol is familiar to everyone as itself.

Even before prohibition alcohol used industrially and commercially was treated so that it could not be used as a beverage. In pre-prohibition days the government wished to be sure to collect the tax that was levied upon alcohol that was not denatured. In these days of prohibition the government denatures the alcohol with unpalatable and sometimes poisonous substances. Wood alcohol or methanol, the deadly sister to ethyl alcohol, is used in some cases. When so treated the industrial alcohol is difficult to use as a beverage.

Common alcohol of the ethyl variety is becoming known among chemists as ethonal. Once it could be called with accuracy "grain alcohol" but now large quantities of it are made synthetically from petroleum and coal and even larger quantities are still made by fermentation of molasses rather than by fermentation of grain.

Consternation was caused in the alcohol-by-fermentation industry not many months ago when successful synthetic processes for making ethyl alcohol began to be commercially important. For instance, at a plant at South Charleston, W. Va., alcohol is produced from either petroleum or the gases from coke ovens. The first step in this synthesis is the cracking of ethane, propane and other hydrocarbons obtained from coke oven gas or petroleum. This produces ethylene which is combined with water and then passed over catalysts to produce alcohol, which is purified through the use of

another most useful chemical, sulfuric acid. As yet, however, synthetic production of ethyl alcohol is not so simple as the synthesis of wood alcohol.

While these chemical advances are threatening the market for molasses and grain as alcohol raw materials, there comes the hope that a process used by the Japanese and Chinese for fermenting rice cakes in the sun centuries before the birth of Christ may rescue the industry of making alcohol by fermentation. By a relatively new "amylo" process, utilizing mold fungi instead of the yeast of more familiar alcoholic fermentation processes, chemists believe that the cost of industrial alcohol produced from grain may be reduced so that it may compete with cheaper sources.

Due to the widespread manufacture of bootleg alcohol that has grown under prohibition, chemists are expressing some concern over the fate of the potential two billion dollar industry of light wines and beer if, as, and when re-established under authorization by Congress. They urge that when light wines and beer are legalized there be incorporated into the authorizing laws the requirement that the beverages be of the highest degree of excellence. They do not wish the beverage alcohol industry to be dominated by a class with bootleg standards and they desire to have restored to domination chemists equipped with all the new information that has been produced in the years when America has been "dry." For, although prohibition has been the rule of the land, this has not stopped fruitful scientific research on the making of alcoholic beverages.

*Science News Letter, January 28, 1933*

#### ZOOLOGY

### Canadian Antelope Herd Healthy and Growing Fast

**E**FFORTS to raise antelope in captivity have at last succeeded with the growth of a herd of 42 at Nemiskam, Alberta, to nearly 500 animals.

The raising of this most timid of wild animals without its being conscious of captivity was accomplished by Canadian government big game specialists, when they decided to save the antelope



**PETTED ANTELOPE**

Warden Edgar McHugh, in charge of antelope at Nemiskam Park, feeding some of his charges

from the extinction which threatened it not long ago with the advance of settlements.

A small herd of 42 animals was found grazing near Medicine Hat. The area on which it was living was fenced in, unknown to the antelopes, and now the shy animals will come to be fed. The preserve here is one of two established in southern Alberta to save this once numerous animal.

*Science News Letter, January 28, 1933*

#### PHYSIOLOGY

### Insulin Stimulates and Fattens Thin People

**F**OR HEALTHY lightweights who otherwise cannot be stuffed to pleasing plumpness, Dr. Harry Blotner of Peter Bent Brigham Hospital in Boston, recommends insulin.

In a recent report to the American Medical Association he describes the results of this use of insulin in nineteen healthy but skinny persons. They all gained weight immediately on three daily doses of ten units of insulin. Most of them held the gain after stopping the insulin.

Dr. Blotner found from careful study of these persons that insulin probably increases the appetite, so that the individual eats more; increases the assimilation of the food; acts as a tonic, making the individual feel stronger, more active and less nervous. No bad effects were reported, but insulin should be used on doctor's orders only.

*Science News Letter, January 28, 1933*

#### PHYSIOLOGY

## Discoveries in Pure Science Conquer Deadly Poisons

**Stain That Makes Germs Visible Under Microscope Found To Counteract Effect of Cyanide and Carbon Monoxide**

**S**EVERAL thousand persons are killed each year by carbon monoxide gas and by cyanides. If half this number can be saved by the newly-discovered antidote, methylene blue, Mrs. Matilda M. Brooks and Dr. J. C. Geiger of San Francisco, will have made an epochal contribution to medicine and the welfare of mankind.

For Mrs. Brooks, working in the department of zoology, University of California, hit upon the idea of using the common bacteriological stain as an antidote for these two poisons, and Dr. Geiger, Director of Public Health, promptly put the idea into use and two lives have already been saved.

Mrs. Brooks, who also holds a doctor's degree, was doing research in biology, working in pure science when she made the methylene blue discovery. She knew that earlier investigators, chief among them Prof. Otto Warburg of the Kaiser Wilhelm Institute for Biology, Berlin, found in connection with work on yeast cells and other organisms that methylene blue counteracts the effect of cyanide and of carbon monoxide on living tissues. Dr. Brooks took the next step and tried the effect of methylene blue on animals that had been poisoned with carbon monoxide or with cyanide. She found it a successful antidote with small mammals, such as mice and guinea pigs, and in a report of her work to the Society for Experimental Biology and Medicine in April, 1932, she suggested the use of methylene blue in human cases of cyanide or carbon monoxide poisoning.

#### For First Aid Kits

When Dr. Geiger called on Drs. P. J. Hanzlik and C. D. Leake, professors of pharmacology at Stanford University and the University of California, respectively, for modern methods of treating poison cases, they suggested to him, among other methods, the methylene blue method for cyanide and carbon monoxide.

As a result of its successful use, methylene blue may become part of

professional first aid kits, such as those carried by fire and police rescue squads. The method used at the Park Emergency Hospital, San Francisco, consists of injecting into the patient's vein a one per cent. sterile aqueous solution of methylene blue, which is listed in the U. S. Pharmacopoeia as methylthionine chloride. In the first cyanide poisoning case reported, 50 cubic centimeters, or nearly two ounces, were used. The patient stated that he had taken 15 grains of potassium cyanide in about 4 ounces of water.

*Science News Letter, January 28, 1933*

#### BOTANY

### Plants of Yellowstone Springs Like it Hot

**T**HERE IS an old nursery rhyme, "Some like it hot, some like it cold." The microscopic threadlike plants of the Yellowstone Park hot springs belong to the former category, Joseph J. Copeland of New York City College found.

The plants belong to the group known as the blue-green algae, and are among the most primitive forms of vegetable life. They are found in the coldest as well as the warmest of the earth's waters, and their special abundance in the Yellowstone hot springs gives those formations much of their rich coloring.

The temperature at which the algae grow most freely, Mr. Copeland found, was 40 degrees Centigrade, 104 degrees Fahrenheit. Some species, however, like it much hotter than that, refusing to grow at temperatures below 50 degrees Centigrade, 122 Fahrenheit. And there are certain species of these vegetable Salamanders that thrive at 80 degrees Centigrade, 176 Fahrenheit. The highest temperature at which living plants were found was over 85 degrees Centigrade, 185 Fahrenheit, or just 15 degrees centigrade below sea-level boiling point.

*Science News Letter, January 28, 1933*

GENERAL SCIENCE

# Super-University for Super-Scholars

## Relief From Economic Care and Routine Promised Geniuses As Aid to "Severe, Prolonged and Fundamental Thinking"

By WATSON DAVIS

**A**N INTELLECTUAL heaven for the Einsteins of the world of learning where they may engage in creative research without financial cares or routine duties is being created.

Prof. Albert Einstein is the head "for life" of the first school of this new "super-university." Its directive force and instigator is Dr. Abraham Flexner, for years one of the heads of Rockefeller's General Education Board and severest critic of the vocational trend in American universities. The necessary financial support is an endowment of \$5,000,000, money made in the marts of New Jersey, donated by Louis Bamberger and his sister, Mrs. Felix Fuld. Princeton University is at present a friendly host to this independent educational agency.

Modest and unassuming is the title of this newest and most advanced of the world's educational and research institutions. It is "The Institute for Advanced Study."

Around such great scholars as Einstein there will be gathered groups of assistants and students. And this will be done without haste, with the atmosphere of Oxford, Cambridge and the other venerable European centers of learning.

Every incoming student of the Institute for Advanced Study will be capable of holding a professorship at an ordinary college. Few if any students will be invited who have not received the highest of ordinary graduate degrees, the Ph.D. But Dr. Flexner has carefully left his academic door open for the exceptional scholar who has not received the routine academic approval conferred by degrees. An occasional unusual genius qualified intellectually may enter his portals of higher learning without the formal blessing of other institutions.

The details of education, so standardized in lower levels, will be left to the great intellects about whom the Institute will operate. If Prof. Einstein does not wish to give lectures to the half-dozen students that may be working with him, he will not do so. He will meet his

colleagues when and where and how he chooses.

Not more than ten students will work with any one professor of the Institute and some of the faculty will desire to have only two or three associated with them. The formal term of study and research will extend for only six months of the year. The other half of the year the staff will be technically on vacation but Dr. Flexner has found that those engaged in research often do their best work while "on vacation." So informal is the work planned at the Institute that it is hoped that the same creative spirit will infuse the working period as often controls the so-called vacations and makes them so productive.

### "This is Heaven"

When a great scholar enters the Institute for Advanced Study he will leave practical cares of life behind him. The entire staff of professors and assistants will be employed full time on such a scale that they need not worry about life's routines but can devote all their energies to "severe, prolonged and fundamental thinking." In addition to ample salaries, there will be retiring allowances, pensions and aid in the education of children.

Prof. Einstein when he was told of the financial arrangements, is said to have exclaimed: "This is heaven!"

Some of the philosophy behind the Institute for Advanced Study was expressed by Dr. Flexner in the following words:

"Institutions of learning are made up of men and women. In this complex modern civilization with its steadily rising standard of living it is of the first importance that education and research should attract gifted and vigorous talent.

"During the last twenty-five years the world has undergone great and important changes. Institutions of learning, once situated in quiet villages, now find themselves in the heart of busy and noisy cities. Men and women who a generation ago might have devoted themselves to academic life are swept into the vortex of practical life.

"Professor Seligman of Columbia

University has recently said that the 'outlook for brains in American universities is an ominous one.' The sacrifices required of an American professor and his family are to a high degree deterrent. The conditions provided are rarely favorable to severe, prolonged, and fundamental thinking. Poor salaries frighten off the abler and more vigorous and compel the university instructor to eke out his inadequate income by writing unnecessary textbooks or engaging in other forms of hack work. I do not need to argue that, despite individual exceptions, American scholarship cannot be promoted upon an unsound and unsatisfactory economic basis.

"It is therefore of the utmost importance that we should set a new standard. We do not need a large faculty. We should endeavor to attract into the Institute a small number of scholars and scientists who will be free from financial worry and concern, who will live and work amidst conditions favorable to intellectual activity. A professorship can of course never be as remunerative as the practice of law or medicine or a successful career in business. It need not be, for it has much to offer that neither law nor medicine nor business can offer.

"But, on the other hand, the German universities long ago proved that adequate remuneration with sufficient leisure amidst attractive and congenial living conditions and associations are absolutely necessary to the upbuilding of an academic group."

### For the Queen of Sciences

To mathematics, the queen of sciences, the first school of the Institute for Advanced Study will be devoted. Associated with Prof. Einstein will be Dr. Oswald Veblen, one of the world's leading mathematicians, who has been connected with Princeton University for twenty-seven years. Dr. Veblen has just resigned as Henry Burchard Fine Professor of Mathematics at Princeton University to accept a professorship in the Institute's School of Mathematics. Prof. Einstein will have his faithful associate, Dr. Walter Mayer of Berlin, as his colleague in his work at Princeton, while Dr. J. L. Vanderslice has been appointed assistant to Prof. Veblen.

To join Prof. Einstein and Dr. Veblen in the school of mathematics of the new institute two other eminent mathemati-



cians were appointed to professorships this year. Both have been connected with Princeton in the past. Dr. Hermann Weyl, now professor of mathematics at the University of Göttingen and a world leader in the new mathematical physics, was research professor at Princeton in 1926 and 1928. Dr. James Waddell Alexander, now professor of mathematics at Princeton, is the other appointee.

### Magnificent Home

One of Princeton University's newest and most magnificent buildings will provide a congenial home for the Institute's School of Mathematics for the next few years at least. When Prof. Einstein arrives in the fall of 1933 to take up his work in this building, he will be able to read over a fireplace in one of its rooms a quotation from his own scientific philosophy: "Raffiniert ist der Herr Gott, aber boshaft ist Er nicht." This has been translated: "God is clever, but not dishonest." It makes a good epigram that way; but like much of the Einsteinian mathematics, the German phrase is also open to other interpretations. It translates a little more correctly as, "God is clever, but not malicious." If Prof. Einstein while formulating his thoughts, gazes through

a certain window of Fine Hall upon the pleasant landscape surrounding it, he will see fashioned into an ornamental device upon its leaded windowpane one of his famous relativity formulae.

Eventually, when this new departure in education has proved itself special buildings for it may be erected but for the present the accent will be upon the few exceptional scholars and students who are being selected.

Quarters for the Institute's School of Mathematics in the year-old mathematics hall memorializing Prof. Henry Burchard Fine, organizer of Princeton's Department of Mathematics, will bring the Institute group into close touch with Princeton's strong department of mathematics. This is headed by Prof. Luther Pfahler Eisenhart, Dean of the Faculty of Princeton as well as chairman of the department of mathematics.

Never will the Institute for Advanced Study be surrounded by the conventional atmosphere of the ordinary university. It will have no student activities, no fraternities, no football team or other athletic endeavors. Toward the trimmings of American Academic life the director of the new Institute, Dr. Abraham Flexner, has been highly critical. Many of the ideas that he expressed in his 1930 book "Universities, American, English and German" are finding expression in the organization of the new Institute. Hammering repeatedly at the "vocational" courses of American universities, and influencing deeply the course of medical education through his activities with the General Education Board, Dr. Flexner has already made a deep imprint on American education.

### Two Specially Cited

Two institutions "which have proved important factors in the intellectual life of this country" are specifically cited by Dr. Flexner in his discussions of the aims and plans for his new Institute. These are the Johns Hopkins Medical School, organized by Dr. William H. Welch, and the Rockefeller Institute for Medical Research, which was established under the leadership of Dr. Simon Flexner, a pupil of Dr. Welch and a brother of Dr. Abraham Flexner.

Another great agency for higher education has been the National Research Fellowship plan of the National Research Council. This is an unorganized super-university which sends exceptional and young doctors of philosophy to work for a year or more in the great research laboratories of this country and abroad. A notable institution of higher learning in the sciences is the California

Institute of Technology, at Pasadena, under the direction of Dr. R. A. Milliken, where advanced research, advanced training, and undergraduate work are carried on hand in hand.

Race, creed or sex will have no influence in the conduct of the Institute for Advanced Study for the founders, Mr. Bamberger and Mrs. Fuld, laid down the principle that "in the appointment of the staff and faculty as well as the admission of workers and students no account shall be taken, directly or indirectly, of race, religion or sex." And in the appointment of Prof. Einstein, who is a Swiss citizen in spite of his long residence in Germany, there is evidence that political boundaries of nations will have no influence.

*Science News Letter, January 28, 1933*

### GENETICS

## New Barley Variety Awaits Return of Beer

A NEW TYPE of barley that is more disease resistant, that will yield more, and that incidentally will make a finer and more potent brew for beer, has been perfected at the University of Wisconsin by Prof. B. D. Leith, and was one of the five crops that was awarded a place in the "hall of fame" of the International Livestock Exposition at Chicago.

Back in 1918 Wisconsin annually raised 38 million bushels of barley, most of which went into the huge beer vats of the state. It was famous as a good "beer barley" but it had one serious drawback. On its stalk were hundreds of little inpointing barbs. These stalks would get into the harvesters' clothes and would creep up and up, despite frenzied efforts to get rid of them. Things got so bad that the farmers' helpers refused to harvest barley crops, and there was a general appeal to the university for help.

Prof. Leith was set at work to discover a new barless type of barley, and it was only a month or so ago that he announced the completion of his work. The new barley has been given the official name of Wisconsin Barless Barley, Pedigree 38. It is almost entirely resistant to striped disease, the scourge of barley. An increase of from ten to twenty bushels to the acre has been made in its yield.

Gustave W. Pabst, well-known Milwaukee brewer, has tested over 5,000 bushels of it and has found that for brewing purposes it is a vast improvement even over the old barley.

*Science News Letter, January 28, 1933*



### SYMBOLICAL

Einstein formula on window in Fine Hall, Princeton University, where Einstein will teach in the Institute for Advanced Study.

## BACTERIOLOGY

**Seven Stages in Life Of TB Germ Given**

**T**HE TUBERCULOSIS germ, like man, apparently has seven stages of life. While the seven stages of man's life were poetically described centuries ago by a famous poet-dramatist, the seven stages of the tuberculosis germ's life cycle are described in scientific terms by Dr. R. R. Mellon of the Western Pennsylvania Hospital Institute of Pathology.

Dr. Mellon reported the results of research to the Society of American Bacteriologists. Ruth D. Richardson, L. W. Fisher and Carl C. Lindegren were his associates.

The life cycle of the tubercle bacillus consists of four stabilized stages which are vegetative and three transition stages between them which are reproductive. Of these reproductive states, two are probably asexual, while evidence for the possible sexual nature of the third was obtained.

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## MEDICINE

**Serum, Fever and Vaccine Fight Undulant Fever**

**I**MMUNE SERUM, artificially induced fever and vaccine feedings are three methods of treating undulant fever that produced improvement in guinea pigs suffering from the infection, C. M. Carpenter and R. A. Boak of the University of Rochester School of Medicine and Dentistry, reported to the Society of American Bacteriologists.

Numerous methods of treating undulant fever in man have been tried without satisfactory results, the Rochester investigators pointed out. In many cases the symptoms subside spontaneously. Consequently it has been hard for scientists to evaluate the various methods of treatment. Their studies of the effects of various remedies on guinea pigs suffering from the ailment are expected to throw some light on their value.

Methods which were unsuccessful in controlling the infection were methyl-violet and thionin given by mouth, and injections of heat-killed vaccine.

Cattle or dairy products are the chief source of the germ causing the disease, at least in New York State, two members of that state's health department, Ruth Gilbert and Marion B. Coleman, reported at the same session. More cases of undulant fever were reported from

New York than from any other state in the country during 1930 and 1931, they found.

Scarcely one-tenth of the cases which occur are correctly diagnosed or reported. This is apparently due to the fact that only a small percentage of the physicians in rural districts where the disease seems to be most prevalent are familiar with the symptoms. In many cases, this disease is not even considered until a sample of the patient's blood, sent to the laboratory to be examined for evidence of another disease, shows the presence of undulant fever.

*Science News Letter, January 28, 1933*

## PSYCHOLOGY

**Light On Eye's Blind Spot Visible By Radiation**

**T**HE field of vision of the blind spot in the human eye is not entirely invisible as scientists once supposed. Bright lights in the field of vision covered by this spot can be seen because the light irradiates from the optic disk to sensitive areas of the eye, Dr. C. R. Garvey, of the Institute of Human Relations, Yale University, told the American Association for the Advancement of Science.

Experiments conducted by Dr. Garvey were designed to discover whether the optic nerve itself is sensitive to light, as has been proposed, or whether the irradiation theory is correct, he said.

This problem has been a puzzle to scientists, because the blind spot is the part of the visual field which corresponds to the optic disk, or gap in the light-sensitive area of the eye, made by the optic nerve as it leaves the eyeball.

After carefully mapping the blind spots of his subjects, Dr. Garvey placed in this area two different types of lights—one a ring like a doughnut, the other a spot like the doughnut's hole. Since they did not overlap in position, they should be easily distinguished by the subject provided the optic disk were light sensitive, he reasoned.

But the two forms of light were not distinguished. The ring and spot were both vague, indistinct blurs of light, or various, irregular, grotesque forms as seen by the subjects, he reported. The ring appeared brighter, however, in about half the trials, and this greater brightness can be explained on the basis of the irradiation theory, Dr. Garvey believes. It is larger and therefore does not have so far to irradiate to reach the sensitive area outside the optic disk.

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**IN SCIENCE**

## PHYSICS

**Wind and Spray Make Sunburn at Sea Worse**

**V**OYAGERS on the high seas who suffer reddened skin even in cloudy weather should not blame solely the ultraviolet radiation for their "sunburn."

Dr. W. W. Coblenz, Bureau of Standards physicist, in making measurements of solar ultraviolet radiation on the ocean has found that the excessive erythema experienced by travelers on the ocean during cloudy weather is accelerated by the wind and by the fine, almost imperceptible, ocean spray.

Measurements made of ultraviolet radiation at sea, far from the land's dust and smoke, did not show appreciable increase in intensity over those made at sea-level land stations where the air is dust free. If the increased sunburn experienced by Dr. Coblenz and his shipmates were due to the ultraviolet radiation entirely, the photochemical dosage intensity meter operated during his voyage by Dr. Coblenz would have shown higher values.

On the heights of Switzerland's famous Jungfrauoch, Dr. Coblenz found that the ultraviolet component in sunlight is not much greater than at lower altitudes. This is in agreement with previous results obtained in Arizona.

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## ASTRONOMY

**Lowell Observatory Director Honored With British Medal**

**D**R. V. M. SLIPHER, director of Lowell Observatory, Flagstaff, Ariz., will receive the Royal Astronomical Society's gold medal this year in recognition of his spectroscopic researches on planets, stars and nebulae. He will deliver the George Darwin lecture later in the year when he goes to London to receive the medal. The planet Pluto was discovered in researches under Dr. Slipher's direction.

The Royal Astronomical Society gold medal is considered one of the highest honors in astronomy.

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# EN FIELDS

## ANTHROPOLOGY

### Peking Man Had Ape-Like Feet But Man's Hands

**F**URTHER exploration of the cave at Choukoutien, China, where the Peking skull was found, has disclosed a small wrist bone not appreciably different from that of modern man and also a piece of collar-bone about the average of the length of the collar-bone of an adult male in North China today.

Describing these discoveries, Prof. Elliot Smith said that the feet of Peking Man showed that he must have walked like an ape, with in-turned toes, but there is no evidence that he shared the apes' ability to grip with his feet. The shape of his hands leaves no room for doubt that this member of the human family had already gained the skill and intelligence which stamp him as genuinely human.

*Science News Letter, January 28, 1933*

## GEOLOGY

### Bacteria In Lake Mud Precipitate Limy Mineral

**G**EOLGY in the making, at the bottom of a Wisconsin lake, was portrayed before the Geological Society of America by Prof. W. H. Twenhofel of the University of Wisconsin. He told of researches conducted on the geological processes now going on in Lake Mendota, which lies in Madison, where the university is situated. His colleagues in this work were Fred T. Williams and Prof. Elizabeth McCoy.

The bottom of Lake Mendota is a soft, oozy sludge, rich in organic material, and underlying this is fairly firm mud to an unknown depth. Samples of the sludge were brought up by means of a clamshell sampler, and cores of the mud by an ingenious core-cutting tube that can be hammered into the bottom and then "hammered out" again with a heavy weight sliding on a cable.

The mud cores were analyzed for their mechanical make up and their chemical contents. Under the microscope they showed only microscopic life and small worms. The former was very

abundant, especially in bacteria and diatoms. The average bacterial count was five millions per gram of dry mud, and it ran as high as fifteen millions.

Bacteria able to live only in the presence of oxygen are present in the upper-layers, bacteria able to live in its absence predominated in the deeper mud. By laboratory culturing, with subsequent physiological testing, it was found that these bottom bacteria are active in taking calcium out of the water and precipitating it in solid form. It does not seem to precipitate as "straight" calcium carbonate, Prof. Twenhofel said, which does not seem to be either calcite or aragonite. The precipitates in the lake are exceedingly high in calcium content, running as high as 80 per cent. calcium carbonate.

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## PSYCHOLOGY

### Teaching Blind Mimicry Seen as Service to Them

**T**HE PANTOMIME of smiling for politeness' sake, and of putting on an expression of fear or concern when a friend tells of a slight mishap, is a language of which the blind know scarcely "a single word."

This is the report of M. Georges Dumas, who has studied the quiet, often apathetic faces of the blind in French institutions, to find out whether they mimic expressions at all, as seeing persons do.

The blind laugh or look sad when genuinely stirred. But those interviewed by M. Dumas did not know how their faces changed in emotion, nor how to produce these expressions at will.

One blind man, accustomed to self-analysis said: "I know perfectly well what you ask me, but I do not know how joy, sorrow, or anger are expressed on my face."

The same man said that he did not feel that his happy, laughing face was different from his face when sad.

M. Dumas attributes the absence of mimicry in blind people to their inability to observe other people and to imitate their expressions. Before his study of the blind, he said he had thought it likely that human beings learn mimicry by a different method than by imitating others. He had speculated "that we imitate voluntarily in our own spontaneous expression after becoming conscious of it through our own muscular and cutaneous sensibility."

*Science News Letter, January 28, 1933*

## GEOLOGY

### Famous Glacier Being Cut By Stream of Water

**N**ISQUALLY Glacier, in Mount Rainier National Park, Washington, is in danger of being considerably damaged through water washing across its snout and cutting into the glacier, according to Superintendent Tomlinson of the park.

After a washout following a storm that occurred about the middle of October, a stream of water started running over the surface of the glacier for a distance of about three-quarters of a mile and has cut through its snout to a depth of approximately fifteen feet. Unless the water can be diverted in some way to the bottom of the glacier, it appears that in time a great deal of damage will result.

Superintendent Tomlinson states that it seems probable that the stream, apparently arising in the accumulation of water on the glacier over a fairly long period of time and augmented by excessive rains of a recent two-months' period, was diverted from its regular course by a landslide.

The Nisqually is one of the best-known of Mount Rainier's glaciers, as a road passes within half a mile of it, with a trail leading from the road to within 100 feet of the snout of the glacier. Measurements made at the snout of the great mass of ice each year show that it is slowly receding.

*Science News Letter, January 28, 1933*

## CHEMISTRY

### Soy Bean Paste Makes Salad Dressing "Stay Put"

**S**ALAD DRESSING of the mayonnaise type can be made without egg as a stabilizing agent, if a paste made from finely ground soy beans is substituted. Advantages claimed for the new method are its low cost, the ease of storing and shipping soy beans as compared with eggs, the possibility of sterilizing the paste immediately before its use and the larger amount of liquid which can be worked into the dressing.

A report on the new salad dressing, which describes in detail how it was made, is published in *Science* by Ada M. Field, Beulah H. Alexander and Ethel B. Sylvanus of the laboratory of home economics, University of California at Los Angeles.

*Science News Letter, January 28, 1933*

## PHYSICS

## Infra-red Rays Blamed For Stuffy Feeling in Hot Rooms

**S**IR LEONARD HILL, the noted English physiologist and writer on public health subjects, finds that certain heat rays (infra-red rays) given off by dark or dull-red sources of heat cause the nostrils to contract and thus interfere with breathing. He believes that this is the chief reason for the sense of stuffiness that we experience in an overheated room.

In a lecture given at the Public Health Congress, London, he showed that this effect is not due to a direct action of the heat upon the nostrils, but that it is a reflex effect from the sensory nerves of the skin. He describes the particular heat rays that give this effect as "nose-shutters."

Their action is especially marked in persons whose breathing is already partially obstructed, those with a deflected septum of the nose, for example, or a person suffering from catarrh, asthma or hay fever.

The effect can be neutralized by fanning the skin of the face with an electric fan, or by the action of certain other

rays, which he speaks of as nose-openers, that are given off especially by luminous sources of heat. They may also be absorbed by water vapor and he suggests that this is the explanation of the efficacy of a bowl of water placed in front of a heater in relieving the stuffiness of a room.

He finds also that these nose-shutting rays cause a diminution in the secretion of the mucous membrane of the nose, and since these secretions may be supposed to protect us from infecting organisms in the air, it is possible that the nose-shutters increase the risks of respiratory infections.

From experiments made at Bedford College, London, he found that 60 per cent. of the persons examined experience difficulty in breathing when exposed to heaters that give off these nose-shutting rays and that in over 25 per cent. of the cases the obstruction to breathing was so marked that it could be demonstrated in records of the respiration made upon a suitable apparatus.

*Science News Letter, January 28, 1933*

## BOTANY

## Married Women Lead In Supplying Flower Names

**G**ET MARRIED, girls, if you want to have flowers named after you. And for choice, get a husband who has either a fortune or big reputation.

This would seem to be the practical moral to a study of flower and other plant names made by Prof. J. B. S. Norton of the University of Maryland. A list of commercially named varieties of flowers, at least in the M's, "looks very much like an abstract from the Social Register," said Prof. Norton.

"This personal naming sometimes leads to strange combinations in reports of flower shows," he continued; "one finds a prize won by Mr. Charles Johnson for exhibiting Mrs. Raymond Jones."

"Perhaps it is some commentary on the impressionability of a man in look-

ing over such lists, where he gets the idea that most of the flowers are named for ladies. To test this out, I just went over the dahlia lists, with which I have had some familiarity, and found that out of about 8,000 variety names, 2,358 were named for women, and 1,627 for men. While this shows considerably more honors for the men than I expected, the ladies far outnumber them. The way these are distributed among the general titles is significant. There are 401 names of dahlias commencing with Mrs., against 120 Madams, 69 Misses, and 23 Mademoiselles, as compared with 19 Mr.'s, and 25 Monsieurs, 17 Fraus and 2 Fräuleins."

There is a good practical reason for giving flowers the names of well-known matrons, Prof. Norton thinks. Flower

breeders want to market their new varieties. They can get a higher price and a readier sale if they appeal to the vanity of a lady who is in a position of influence either in her own right or through marriage to a prominent man. So Mrs. and Madame take the lead over Miss and Ma'mselle.

But although the ladies receive most attention in the naming of flowers, male vanity is not at all overlooked. Sometimes it leads to difficulties. Only one variety of a given flower is supposed to be named for one person; but a newly-elected congressman or a newly-prominent hero does not always know this, and readily gives permission to anybody who requests the privilege of naming a plant after him. Thus, Rudy Vallee has given his consent to the use of his name for at least two distinct varieties of dahlia.

*Science News Letter, January 28, 1933*

## PUBLIC HEALTH

## Chemical Kills Germs Better Than Hot Water

**I**N THE LONG RUN, chemical washes are more effective than hot water in killing germs and preventing their subsequent development on milk cans and other milk utensils, A. G. Lochhead and C. K. Johns of the Central Experimental Farm at Ottawa, Canada, found.

In tests reported to the Society of American Bacteriologists they used milking machine tubes and milk cans that had been uniformly contaminated with sour milk containing very many of one type of germ, *B. coli*, which may cause disease in man.

Washing with water at 170 Fahrenheit for 20 minutes destroyed the greatest number of the germs, while lye, which was only slightly less effective than the hot water, was the best *B. coli* destroyer of any of the chemicals used. Chlorine compounds were more effective in keeping down the total number of germs of all kinds, the lye acting more specifically against *B. coli*. Examination of the cans 19 hours after treatment showed that the chemicals were decidedly more effective than hot water in preventing subsequent development of the bacteria.

*Science News Letter, January 28, 1933*

Longfellow's famous poem "The Skeleton in Armor" was inspired by remains of an Indian, and not a Norseman as he supposed.

BIOLOGY-GEOLOGY

# Earthworms as Soil-Makers

## "A Classic of Science"

**"Vegetable Mould" is a Misnomer, According to Darwin,  
For the Pulverized Soil is Prepared by Earthworms**

**ON THE FORMATION OF MOULD.** By Charles Darwin. In *Transactions of the Geological Society of London, second series, vol. V. London: 1840. (Read November 1, 1837).* This is an exact reprint of the original publication.

**T**HE FORMATION of the superficial layer of earth, commonly called vegetable mould, offers some difficulties in being fully understood, which apparently have been overlooked. In old pasture lands, the mould, to the depth of a few inches, differs but slightly, although resting upon various kinds of sub-soil. The uniform fineness of its particles is one of its chief distinguishing characters; and this may be well observed in a gravelly country, where a recently ploughed field immediately adjoins another, which has long remained undisturbed for grazing. In the latter, not a pebble will be seen, either on the surface or immediately below it; although in the ploughed field, a large proportion of the soil may be composed of small stones. From the prevailing use of the expression "vegetable mould", it would appear that its origin is generally attributed to some effect of vegetation; yet it is scarcely conceivable that the turf, in the case of the two adjoining fields, can have produced so remarkable a difference as that alluded to.

My attention was called to this subject by Mr. Wedgwood, who showed me, whilst I was staying at Maer Hall, in Staffordshire, several fields, some of which a few years previously had been covered with lime, and others with burnt marl and cinders. These substances, in every case, were buried some inches beneath the turf. In several parts of three grazing fields, I dug square holes, and obtained the following re-

sults:—1st. In some good pasture land which had been limed, without having been ploughed, about ten years before, the turf, or the layer in which the roots of the grasses are closely woven together, was about half an inch thick. At two inches and a half beneath this, or about three from the surface, a layer of lime, or a row of small aggregated lumps of it, formed a well-marked white line around the holes. The soil beneath this layer of lime was gravelly, or of a coarse sandy nature, and differed considerably from the mould nearer the surface. About three years ago cinders also had been spread on this field; but when I examined it, they were buried at the depth of one inch. They were not sufficiently numerous to form a layer, though a line of black spots could clearly be traced parallel to and above the white one of lime. Some other cinders, which had been scattered in another part of this same field, only about half a year before, lay either on the surface or were entangled in the roots of the grass.

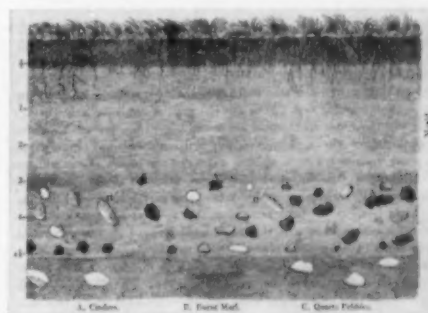
The second field, I mention only from the fact of the cinders being buried in such quantities, about three inches deep, as to form a stratum nearly one inch in thickness. The layer in some parts was so continuous, that the upper soil was united to the lower only by the longer roots of the grasses. The sub-soil was a red clay, and it occurred a little below the cinders.

The third case which I shall describe, is that of a field which, Mr. Wedgwood informed me, was waste land fifteen years ago. It was at that time drained, ploughed, harrowed, and well covered with burnt marl and cinders. It has not been disturbed since, and now supports a tolerably good but rather coarse pasture. The section in this field, as represented in the woodcut was turf half an inch; vegetable mould two inches and a half; a layer, one and a half inch thick, of fragments of burnt marl, (conspicuous from their bright red colour), of cinders, and a few quartz pebbles, mingled with earth.

One of the angular fragments of burnt marl lying near the bottom, measured one inch in length by half an inch in breadth, and a quarter in thickness. Lastly, about four inches and a half below the surface, was the original black peaty soil. We thus find, beneath a layer, nearly four inches thick, composed of fine particles of earth mixed with decayed vegetable matter, those substances which had been spread on the surface fifteen years before.

The appearance in all the above cases was, as if (in the language of the farmers, who are acquainted with these facts) the fragments had worked themselves down. It is, however, scarcely possible that cinders or pebbles, and still less powdered quick-lime, could sink through compact earth and a layer of matted roots of vegetables, to a depth of some inches; nor is it at all probable that the decay of the grass, although adding to the surface some of the constituent parts of the mould, should separate in so short a time the fine from the coarse earth, and accumulate the former on those objects, which so lately had been on the surface. I may add, that I have repeatedly observed fragments of pottery and bones buried beneath the turf, in fields near towns, (on which such substances are often thrown with manure); and as these fields did not appear to have been ploughed, the circumstance often surprised me. On the contrary, I have noticed in gardens lately dug, that the rain, by washing away the finer particles, leaves stones and other hard bodies accumulated on the surface.

(Turn Page)



**SECTION OF SOIL**

—in a field undisturbed for fifteen years. The cinders, marl and pebbles were at first on the surface of the soil. The mould was carried up and deposited on top of them during that time.

The subject of this paper was later elaborated by Charles Darwin into a book, "The Formation of Vegetable Mould, through the Action of Worms, with Observations on their Habits", published in London in 1881 and in New York by D. Appleton & Co. in 1890, with several later editions. Through the intervening half century, he had gathered many additional observations of the activity of worms, especially from a large number of Roman ruins discovered in England, whose foundations were excavated and examined.



The explanation of these facts, which occurred to Mr. Wedgwood, although it may appear trivial at first, I have not the least doubt is the correct one, namely, that the whole operation is due to the digestive process of the common earth-worm. On carefully examining between the blades of grass in the fields above described, I found scarcely a space of two inches square without a little heap of the cylindrical castings of worms. It is well known, that worms, in their excavations, swallow earthy matter, and that, having separated the portion which serves for their nutriment, they eject at the mouth of their burrows the remainder in little, intestine-shaped heaps. These partly retain their form until the rain and thaws of winter, as I have observed, spread the matter uniformly over the surface. The worm is unable to swallow coarse particles, and as it would naturally avoid pure or caustic lime, the finer earth lying beneath the cinders, burnt marl, or lime, would be removed, by a slow process, to the surface. This supposition is not imaginary; for in the field in which cinders had been spread out only half a year before, I actually saw the castings of the worms heaped on the smaller fragments. Nor, I repeat, is the agency so trivial as at first it might be thought: the great number of earth-worms, as every one must be aware who has ever dug in a grass field, making up for the insignificant quantity of the work which each performs. On the idea of the superficial mould having been thus prepared, the advantage of old pasture land, which it is well known farmers in England are particularly averse to break up, is explained; for the length of time required to form a thick stratum must be considerable. In the peaty field, in the course of fifteen years, about three inches and a half had been well prepared; but it is probable that the process is continued, though at a very slow rate, to a much greater depth. Every time a worm is driven, by dry weather or any other cause, to descend deep, it must bring to the surface, when it empties the contents of its body, a few particles of fresh earth. Thus, the manures added by man, as well as the original constituent parts of the soil, become thoroughly mingled, and a nearly homogeneous character is given to the whole.

Although the conclusion may appear at first startling, it will be difficult to deny the probability, that every particle of earth forming the bed from which the turf in old pasture land springs, has passed through the intestines of worms; and hence the term "animal mould"

would in some respects be more appropriate than that of "vegetable mould".

I may conclude by remarking, that the agriculturist in ploughing the ground follows a method strictly natural; he only imitates in a rude manner, without being able either to bury the pebbles or to sift the fine from the coarse earth, the work which nature is daily performing by the agency of the earth-worm.

*Note.*—Since my communication on the "formation of mould", read on the 1st of November, I have received from Staffordshire an account which corroborates the statements then made, on the apparent sinking of objects placed on the surface of turf land. The first case I mention only because the substance is different from those previously described. In the spring of 1835 a boggy field, which had long remained as grass land, was so thickly covered with sand that the whole surface appeared of a red colour. At the present time, namely about two years and a half afterwards, the sand forms a layer three-fourths of an inch below the surface, that thickness consisting of peaty soil.

The second case is more interesting. It has been ascertained that a field, which has since been ploughed, was covered about eighty years ago with

marl; an imperfect layer of it, but sufficiently distinct to be traced, is now found at a depth, very carefully measured from the surface, of twelve inches in some parts and fourteen in others: the difference corresponding to the top and hollow of the ridges produced by ploughing. It is certain, the marl must have sunk or been buried before the field was ploughed, for otherwise the fragments would have been scattered in the soil: this conclusion, moreover, explains the circumstance of the layer being horizontal, whilst the surface is undulating. At the present time no plough could possibly touch the marl, as the land in this country is never turned up to a greater depth than eight inches. In the preceding communication, I have shown, that in a field lately reclaimed from being waste land, three inches of mould had been prepared by the worms in the course of fifteen years. We now find, that within a period of less than eighty years, (but how much less cannot be told, unless the date when the field was first ploughed were known) the earth-worms have covered the marl, which was originally strewed on the surface, with a bed of earth of an average thickness of no less than twelve or thirteen inches.

November 14, 1837.

*Science News Letter, January 28, 1933*

#### **PATHOLOGY**

## **Cholesterol Makes Ready For Growth of Cancer**

**C**HOLESTEROL, an important chemical compound found in animal tissue, "prepares the soil" for the growth of cancer. This new theory of a cause of cancer is suggested in a report by Dr. A. H. Roffo of Buenos Aires in the *American Journal of Cancer*.

Cholesterol is found in all animal fats and oils and in many organs.

In the case of skin cancers, Dr. Roffo believes that cholesterol is accumulated in the skin by the effects of exposure to light and in turn acts as a condition for the production of cancer. It prepares the soil, as he expresses it, probably because under the influence of light it itself becomes photoactive, emitting emanations which affect the surrounding tissue.

As evidence for these views he presents such facts as these:

Cancerous tissues show an increased

cholesterol content compared with normal tissues, especially in the skin.

Tumor cells show a tendency to absorb and fixate cholesterol from the blood, or, in the case of cell cultures, from the surrounding medium.

In the skin a fixation of cholesterol in the tissues is favored by exposure to light. His analyses show that in the face and other parts of the skin exposed to light more cholesterol is present than in those parts protected from the light by clothing. He finds in this relationship an explanation of the fact that skin cancers are frequent on the face and rare where the skin is covered by clothing.

So far as skin cancers are concerned he sums up his views in the statement that "cholesterol prepares the soil for subsequent malignant growth by acting as an accumulator of light."

*Science News Letter, January 28, 1933*

## PSYCHOLOGY

# Public and Private Attitudes Found to be Inconsistent

People Who as Individuals Approve Card Playing But Object as a Group Are Among Those Studied

THE "PUBLIC" attitude adopted by people when influenced by membership in church, lodge, or other institution, may be completely different from the "private" attitudes of the members as individuals. Thus, as church members a certain group may be opposed to card-playing with face cards although privately the individual members may have no objection to the practice.

So Dr. Richard Louis Schanck, of Syracuse University, found in a careful survey of a village in New York State, reported in *Psychological Monographs*, an official organ of the American Psychological Association.

Dr. Schanck attempted, in his survey, to find out just what the influences are which produce these "public attitudes." The impression that practically all other members of the institution hold the attitude in question and the feeling that others expect members to hold it seem to be important factors, he found.

In one of the churches, a certain old lady was very powerful in directing the affairs of the institution. She was the daughter of a former pastor, long since dead. More than half the church members held publicly that because of this connection, Mrs. Salt's views should be given special consideration. Of these members 87 per cent. thought all members held the same attitude while the other 12 per cent. were sure most members agreed.

An actual check-up of personal views of individuals showed, however, that only nine members, or less than a fifth of the total, would accord any extraordinary respect to Mrs. Salt's opinion in church affairs.

It is an error to think of the private attitude as being more real or true than the public attitude, Dr. Schanck points out. In fact the public attitude may be the more important because it is more likely to determine behavior.

"It seems that there is no such thing as a real man," he said. "A man when with the Romans may do as the Romans do. In the study just concluded people were found to possess at least two atti-

tudes on the same variable and perhaps under some conditions they might have more."

In a small community such as the one studied consistency in public attitudes of the same individual is necessary because all acts or words which appear outside the privacy of the family or intimate circle are likely to be circulated at large. What you believe as a Methodist or Baptist, you must also believe in your lodge or at your club.

In a large city, however, a business man might have a church, a business, and a private attitude, no two of them alike, on the same subject, prohibition, Dr. Schanck said.

*Science News Letter, January 28, 1933*

## ARCHAEOLOGY

## Vikings Given Praise As Empire Builders

THE OLD PICTURE of the Viking as a ruthless, fighting dog of the sea is a poor caricature, it appears from discoveries made through archaeological researches in Baltic countries. The new-style Viking picture shows these vigorous Northmen as astute traders, colonizers, and even founders of empire.

That Swedish Vikings were colonizers on a large scale and founded a Baltic colonial empire over 1,000 years ago, is pointed out by Sweden's chief antiquarian, Sigurd Curman. The Viking strategy was first to obtain possession of all important points, such as river inlets and sounds. From these vantage posts they could dominate the sea and its traffic.

In their trading ventures, the Vikings carried their small ships as far as the Mediterranean and Black Seas. They crossed the entire Russian continent, following the big rivers.

Recent excavations, especially in Latvia, have shed light on the Viking colonizing projects, and further revelations are expected. At Grobin in Latvia large burial fields in which Swedish men and women were interred have been found.

*Science News Letter, January 28, 1933*

# Seven Famous Scientists Are Ready To Talk With You

1. Dr. Robert A. Millikan, on *The Rise of Physics*
2. Dr. William H. Welch, on *The Tubercle Baccillus*
3. Dr. John C. Merriam, on *The Record of the Rocks*
4. Dr. Edwin G. Conklin, on *The Mystery of Life*
5. Dr. Karl T. Compton, on *Science and Engineering*
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## From Page 51

ing chapter of his book "The Engineers and the Price System" (Viking Press).

Titling it "A Memorandum on a Practicable Soviet of Technicians," Dr. Veblen (for he was a professor of economics and a Yale Ph.D.) opened with:

"It is the purpose of this memorandum to show, in an objective way, that under existing circumstances there need be no fear, and no hope, of an effectual revolutionary overturn in America, such as would unsettle the established order and unseat those Vested Interests that now control the country's industrial system."

### Technical Men Necessary

It is suggested that Veblen may have written this with his tongue in his cheek. Today he might not have used the word "soviet," with its U.S.S.R. implications. But he clearly realized that scientifically trained men and engineers, "technicians" he called them, are necessary to the establishment of a new order. He wrote:

"No effectual move in the direction of such an overturn can be made except on the initiative and under the direction of the country's technicians, taking action in common and on a concerted plan. Notoriously, no move of this nature has been made hitherto, nor is there evidence that anything of the kind has been contemplated by the technicians. They still are consistently loyal, with something more than a hired-man's loyalty, to the established order of commercial profit and absentee ownership. And any adequate plan of concerted action, such as would be required for the enterprise in question, is not a small matter that can be arranged between two days."

Any plan of action, Veblen em-

phasized, that shall hope to meet the requirements of the case in any passable fashion must necessarily have the benefit of mature deliberation among the technicians who are competent to initiate such an enterprise. He listed the following initial requirements, indispensable to the initiation of any enterprise of the kind in such an industrial country as America:

It must engage the intelligent cooperation of several thousand technically trained men scattered over the face of the country, in one industry and another.

It must carry out a passably complete cadastration (survey) of the country's industrial forces.

It must set up practicable organization tables covering the country's industry in some detail,—energy-resources, materials, and man power.

It must also engage the aggressive support of the trained men at work in transportation, mining, and the greater mechanical industries.

Setting down "without a touch of ambiguity" his belief that any fear of an effectual move toward government by technicians is "quite chimerical" and that "absentee ownership is secure, just yet," Veblen nevertheless fashioned a working drawing of technologic rule.

### Abdication Most Probable

His purpose was, he wrote, "to set out in summary fashion the main lines which any such concerted plan of action would have to follow, and what will of necessity be the manner of organization which alone can hope to take over the industrial system, following the eventual abdication or dispossession of the Vested Interests and their absentee owners."

Not necessarily through revolutionary overturn with blood and class war would the change occur. Veblen wrote:

"It is always the self-made though

reluctant abdication of the Vested Interests and their absentee owners, rather than their forcible dispossession, that is to be looked for as a reasonably probable event in the calculable future. It should, in effect, cause no surprise to find that they will, in a sense, eliminate themselves, by letting go quite involuntarily after the industrial situation gets quite beyond their control."

Remember that he wrote in 1919 just after the World War and before the period of prosperity that evolved into the current depression. At that time, Veblen said, the "Vested Interests and their absentee owners" had already sufficiently shown their unfitness to take care of the country's material welfare, "which is after all the only ground on which they can set up a colorable claim to their vested rights." And he added that "something like an opening bid for a bargain of abdication has already come in from more than one quarter."

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### PSYCHOLOGY

## Awareness of Surroundings Due to Response to Them

IT IS NOT the raucous note of the automobile horn that makes you aware of its sound, but rather your own jump and quickened heart beat and the other responses that you make to it.

No matter how loud and strong and close to your ear the sound may be, or how often the horn may honk at you, unless you make some response, outwardly or inwardly, you will have no knowledge of it. This is a practical illustration drawn from the theory proposed by Dr. Herbert S. Langfeld, of Princeton University.

Dr. Langfeld quoted many authorities from the Greek philosophers to present-day experimenters in support of his theory that it is not your awareness of a situation that makes you act, but your action that makes you aware.

Experiments have been made which detected that movements accompany silent thought, he said. The action patterns during silent thought correspond to those obtained when words are actually spoken. Dr. Langfeld predicted that more research of a similar nature will be conducted in the future.

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The dachshund is a German breed as old as Roman Empire days, in the opinion of a German scientist who has studied the dogs of early civilization.

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ZOOLOGY

# NATURE RAMBLINGS

by Frank Thone



## Never Asked for the Job

ISN'T it odd how a harmless little animal like the groundhog has to take the blame for subsequent bad weather if the sun happens to shine on the second of February!

It becomes even odder when we learn that this weather superstition originated in the Old World, and that the groundhog is strictly an American animal. The drafting of the groundhog to be the "goat" for spring weather caprices seems to have been due to the application of the superstition to the hedgehog in some parts of Europe. The hedgehog is as strictly of the Old World as the groundhog is of the New, so that when European settlers arrived in this country they had to find a substitute. The two animals don't look much alike, but both of them are small, and familiar creatures about the fields, and both of them hibernate in regions where winters are cold.

Setting Candlemas Day as the official time for the groundhog's emergence, unless the winter is to be prolonged another six weeks, is a bit severe on our little animal. That would be all right for the British Isles and other western European lands, where the modifying influence of the ocean makes for brief, mild winters; but over most of America a "continental" climate prevails, and the winters are longer and colder, so that very few hibernating animals care to emerge so early as the beginning of February. Only as far south as the Carolinas has the groundhog ever been seen during the first week in that decidedly winter month. Over most of the country it is no use looking for him until early in March.

The groundhog is an animal of many aliases. He is called groundhog mainly in the South; north of the Mason-Dixon line he is most often called woodchuck,

presumably because he likes to start his burrow under the shelter of old logs or piled-up broken branches. A closely related animal, that lives among tumbled stones in mountainous regions, is called the rock chuck. Marmot is another name for the groundhog-woodchuck.

Whatever title one prefers to give this little involuntary (and quite unreliable) weather prophet, the "hog" part of the groundhog name is quite out of character. For he is related to the swine family only insofar as he is a mammal. His real affiliations are with the rodents, that numerous and adaptable tribe which includes rats, rabbits, squirrels, beavers, and that other porcine misnamed animal, the guinea pig.

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## ENGINEERING

### Organized Engineers Repudiate Technocracy

TECHNOCRACY was dubbed "class dictatorship" and repudiated by the organized professional engineers of the nation represented by the American Engineering Council in annual meeting in Washington.

Strong resolutions declaring that "our present economic structure contains within itself the possibilities of progressive improvement and the attainment of higher standards of living" were adopted by the engineers. They also resolved that "applied science holds the promise of better things to come in a society which fearlessly and intelligently meets its problems."

Stating that claims of the Technocracy group have received wide publicity by reason of "startling predictions which involve a complete overturn in our economic structure," the engineers called the promise of a quick solution of economic ills by the New York group "unwarranted." They further charged that the technocratic data and statistics are open to question and the method of presentation has been marked by "exaggerated, intolerant and extravagant claims."

Complete replacement of men by the machine is precluded by the law of diminishing returns, the resolutions recited. That is, the point is being reached in some industries where it is unprofitable to continue to replace men with machines.

The volume of goods produced, distributed and consumed during 1928 and 1929 was not excessive, the engineers

concluded, and they predicted that that volume may and should be surpassed upon the return of prosperity. Technical improvement was called the "only possible basis for continuing material progress."

Howard Scott and the Columbia University technocrats were called bureaucrats and repudiated by William Henry Smyth, 78 year old Berkeley, California, mechanical engineer, who in 1919 published the first article on "technocracy."

In a communication to the Engineering Council, Mr. Smyth charged that the technocrats had misappropriated his invention of the word "Technocracy" and surrounded it with false doctrine.

Mr. Smyth urges a supreme national council of scientists superior even to the U. S. Supreme Court to deal with the constructive and distributive factors, and the conventions of the nations.

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## On The Cover

THE DARK, oblong areas pictured on the front cover are all that remain of a pre-Ice Age collision of cosmical magnitude, the smattering of a part of what is now southeastern United States with fragments of a comet. This is the belief of Profs. F. A. Melton and William Schriever of the University of Oklahoma. (SNL, Dec. 31, '32, p. 418) The photograph emphasizes the great area covered by these depressions, for each little dot is a tree and there are thousands of dots in some of the ovals.

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The Science Service radio address next week will be on the subject

**MINERAL RESOURCES—**

**AN INTERNATIONAL RESPONSIBILITY**

by

**Prof. Richard M. Field**

Of the Department of Geology of Princeton University

**FRIDAY, FEB. 3**

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Over Stations of The Columbia Broadcasting System

# • First Glances at New Books

## Ethnology

MAGIC AND MYSTERY IN TIBET—Alexandra David-Neel—*Claude Kendall*, 320 p., \$3.75. The world has become familiar with the superficial queer-ness of Tibet. This book goes deeper, into the mysticism and philosophy of the strangest of living people. Madame David-Neel writes from an exceptional vantage point, for she is a European woman who has taken on Tibetan ways even to becoming a Buddhist and acquiring the rank of a Lama. She describes mystic banquet rites in cemeteries, psychic sports, demons and ghosts, and also the spiritual training of the Tibetan religious disciples. At the end she expresses the hope that her account may interest competent scientists in investigating the psychic phenomena of Tibet.

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## Horticulture

GARDENS AND GARDENING, 1932—Edited by F. A. Mercer—*Rudge, New York*, 122 p., \$4.50. A garden annual picturing and describing some of the most gracious of English gardens. American home-developers will find many useful suggestions for design and for architectural settings, though of course horticultural practices in this country must necessarily differ from those of England.

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## Horticulture-Botany

WESTERN AMERICAN ALPINES—Ira N. Gabrielson—*Macmillan*, 271 p., \$3.50. Rock gardening in this country has now demonstrated itself as an established method of home grounds ornamentation and no fad, so that an inquiry into the availability of native plants, especially from the great reservoir of the West, is very much in order. The author writes intimately in the first person, with an atmosphere of chumminess with his herbs and shrubs, that makes them seem naturalized into your garden even before they are planted there.

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## Archaeology

SOME RESEMBLANCES IN THE CERAMICS OF CENTRAL AND NORTH AMERICA—George C. Vaillant—*Privately printed for the Medallion, Globe, Ariz.*, 50 p. "This essay," writes Dr. Vaillant, "is not a treatise, but a suggestion to students for whom a rich field

of comparative material lies waiting whenever they feel disposed to undertake an exhaustive study of connections between Central and North America." "Suggestions" are often vague, but Dr. Vaillant has filled his essay with specific comments on cultural resemblances. Almost 200 of the vessel forms named in the text are shown in outline drawings. There is a twelve-page bibliography.

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## Social Science

INTERNATIONAL MIGRATIONS, Vol. II, Edited by Walter F. Willcox—*National Bureau of Economic Research*, 715 p., \$7. An impressive group of scholars from many countries has contributed to make this volume a truly monumental consideration of the wanderings of man upon the earth in recent years. Of statistical tables alone there are 270, while its twenty chapters are divided into three parts: Population of the earth, studies of national immigration currents, and studies of national emigration currents.

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## Zoology

THE MARINE AND FRESH-WATER SPONGES OF CALIFORNIA—M. W. de Laubenfels—*Smithsonian*, 140 p. Of interest to systematic zoologists.

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## Genetics

A TEXTBOOK OF GENETICS—A. W. Lindsey—*Macmillan*, 354 p., \$3. An unusually direct and clean-cut treatment of the whole subject of genetics as known today, which cannot help getting into the student's head if he has a head at all to put it in. The opening discussion of the history of genetics is complete in spite of its brevity; and the sane conservatism of the closing chapter on eugenics is equally to be recommended.

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## Engineering

PROCEEDINGS OF THE AMERICAN SOCIETY FOR TESTING MATERIALS, Vol. 32, Part I, Committee reports, tentative standards, 1069 p., \$6. Part II, Technical papers, 824 p., \$6.

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## Sociology-Engineering

HOME OWNERSHIP, INCOME AND TYPE OF DWELLINGS, Vol. IV, 230 p., \$1.15. FARM AND VILLAGE HOUSING, Vol. VII, 293 p., \$1.15. HOUSING OBJECTIVES AND PROGRAMS, Vol. XI, 345 p., \$1.15. *President's Conference on Home Building and Home Ownership*. These are volumes in the series of eleven books giving the results of the President's Conference on Home Building and Home Ownership. These publications comprise the most comprehensive study of the problems of home building and home ownership on a nation-wide basis that has yet been compiled. Volume IV covers ownership and leasing of houses, income in the home, low-cost housing, dwelling types and varieties and housing trends. Volume VII covers rural housing conditions and problems, design and construction, farmstead planning and beautification, economic and educational aspects. Volume XI contains a comprehensive report on technological developments together with addresses by President Hoover and others and committee reports on standards and objectives, search, legislation and administrative education and service and organization programs.

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## Chemistry-Engineering

OUR MINERAL CIVILIZATION—Thomas T. Read—*Williams and Wilkins*, 165 p., \$1. This new volume in the Century of Progress series tells of fuels, metals and non-metals, their origin, uses and importance, in a style at once highly readable and highly informative.

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## Physics

EXPERIMENTAL COLLEGE PHYSICS—Marsh William White—*McGraw-Hill*, 283 p., \$2.50. This laboratory manual of experiments in physics is not merely a compilation of directions for performing experiments, but includes a statement of important theory underlying each experiment together with suggestive questions and problems. It is the development of ten years at Pennsylvania State College.

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